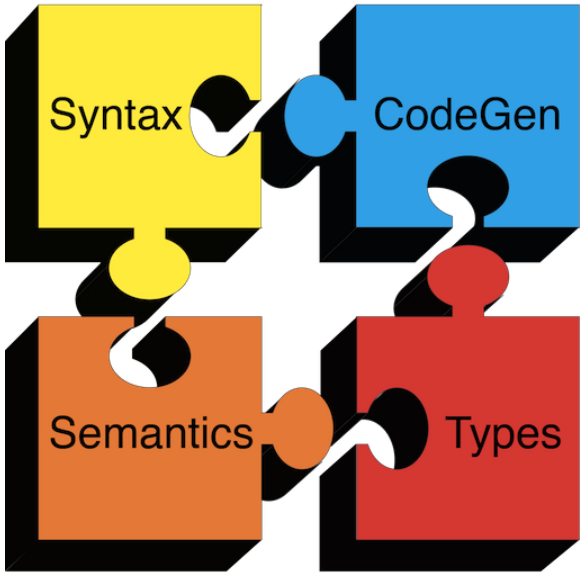
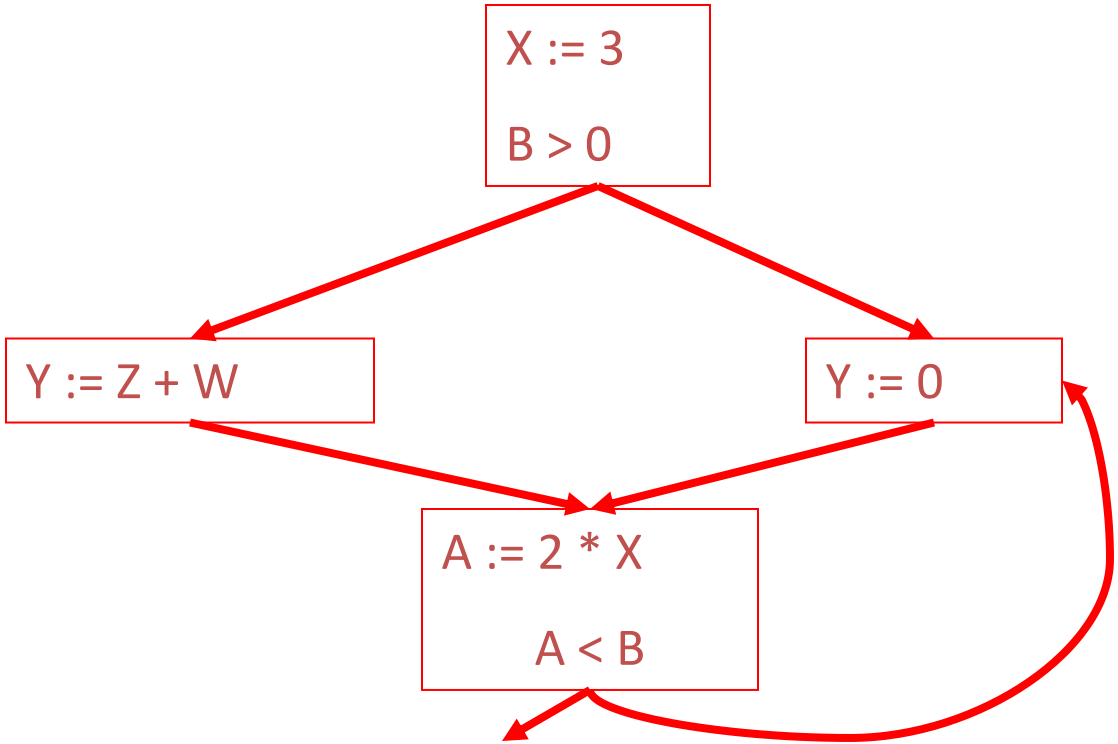


Compilers

Analysis of Loops

Analysis of Loops

- To understand why we need ⊥, look at a loop



Analysis of Loops

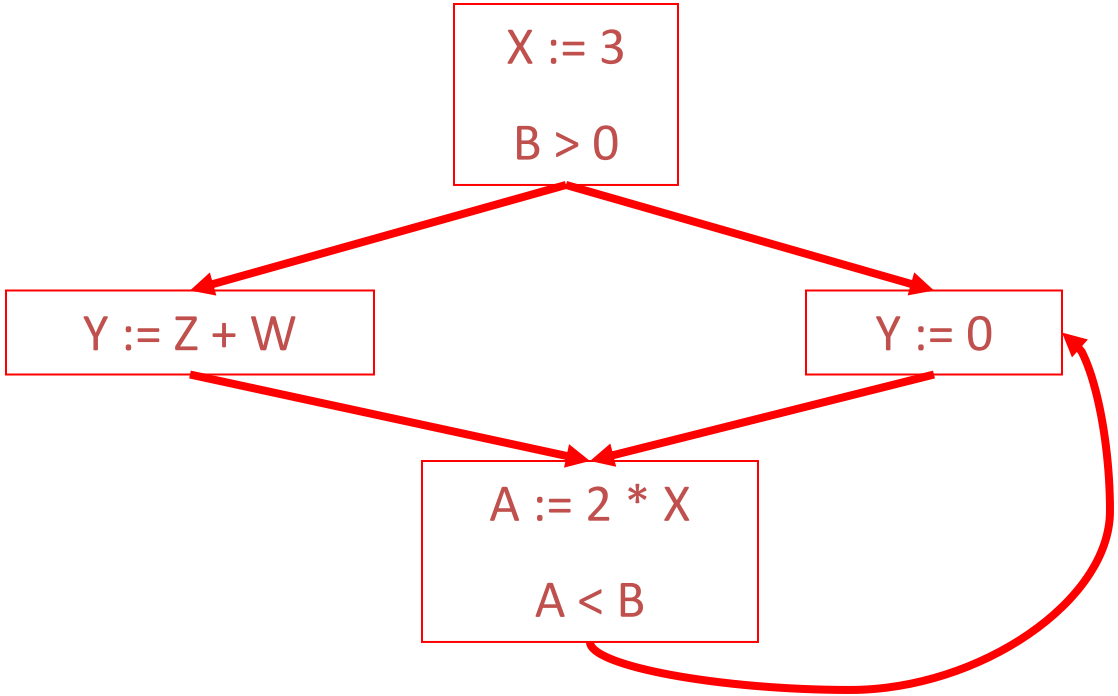
- Consider the statement Y := 0
- To compute whether X is constant at this point, we need to know whether X is constant at the two predecessors
  - X := 3
  - A := 2 * X

- But info for A := 2 * X depends on its predecessors, including Y := 0!

Analysis of Loops

- Because of cycles, all points must have values at all times
- Intuitively, assigning some initial value allows the analysis to break cycles
- The initial value $\perp$ means “So far as we know, control never reaches this point”

Analysis of Loops



Analysis of Loops

After running the constant propagation algorithm to completion, choose the correct dataflow information for X, Y, and Z at the program point labeled at right.

	X	Y	Z
○	T	1	T
○	4	T	5
○	4	1	5
○	4	T	T